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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Joost Freck Reijerse

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EXAMINER

YANCHUK, STEPHEN J

ART UNIT

PAPER NUMBER

4131

MAIL DATE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/534,691	Applicant(s) REIJERSE ET AL.	
	Examiner STEPHEN YANCHUK	Art Unit 4131	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06/06/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☒ Claim(s) 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/13/2005, 06/06/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

**METHOD FOR FORMING A SEPARATOR PLATE FOR A FUEL CELL, AND
SEPARATOR PLATE**

Examiner: S. Yanchuk SN: 10/534691 Art: 4131 October 28, 2008

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claim 25 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 25 does not identify if the coating is transferred to the metal plate or if the coated membrane inherently provides coating materials to the plate because of its proximity to the plate.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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2. Claims 1-6, 8-10, 12-24, 26, 30-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshioka et al. (PGPUB 2001/0023603).

Claim 1 is rejected by Yoshioka et al. teaching a hydraulic press machine with female upper die and male lower die [Paragraph 16] or one with another embodiment with a female die on top and a blank die on the bottom [Figure 7]. The hydraulic power unit is connected to the bottom of the lower die [Paragraph 17]. A stainless steel plate is loaded between the two die and will become a separator plate with a number of projected sections [Paragraph 15].

Claim 2 is rejected by the teaching of the hydraulic pressure being applied so that the sheet metal is fixedly retained on the upper die [Paragraph 8].

Claim 3 is rejected by the teaching of using a pressure that manufactures a sheet metal without causing cracks and warps and shear drop at each shoulder [Paragraph 21]. This is caused by the hydraulic pressure being applied so that the sheet metal is fixedly retained on the upper die [Paragraph 8].

Claims 4, 21, 22, 23, 24 are rejected by the teaching of the hydraulic pressure being from 140 kgf/cm^2 (142 Bar) to 2000 kgf/cm^2 (2039 Bar) [Paragraph 24].

Claim 5 is rejected by the teaching of the 1st manufacturing process where the hydraulic fluid pushes the sheet metal to the upper end surface of the peripheral wall (against the upper die) [Paragraph 23].

Claim 6 is rejected by the 3rd step where the upper die is pressed into the metal plate [Paragraph 24].

Claims 8, 9, 15, 26 are rejected by the metal plate being made of stainless steel [Paragraph 15]. One of ordinary skill in the art would know that steel can have an elongation percent of 20% at fracture.

Claim 10 is rejected because Yoshioka et al do not teach adjusting the temperature of the system.

Claims 12, 16 are rejected by the teaching of the stainless steel sheet being less than .5 mm thick [Paragraph 15].

Claims 13, 14 are rejected by the teaching of the 5 stages of the process of deforming a stainless steel plate [Paragraph 23-26] that give the outcome of a metal sheet with cylindrical projections [Paragraph 15].

Claims 17-20, 30-38 are rejected by the teaching of the stainless steel plate of less than .5mm in thickness being formed with cylindrical projections each of 2-3mm in diameter and .4-.6mm in height and spaced 2-5mm apart [Paragraph 15].

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka et al. (PGPUB 2001/0023603) as applied to claim 1 above, and further in view of Hwang et al (USPAT 6,090,228).

Yoshioka teaches a hydraulic deformation process of a stainless steel plate, but fail to teach a membrane between the plate and the water.

Hwang teaches a stainless steel plate that is coated with nickel or aluminum in order to reduce corrosion rate of the plate [Col 1 Ln 6]. Stainless steel with a nickel plating layer and copper particle coating is also taught [Figure 5]

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of a Hwang et al. with the process steps of Yoshioka in order to create a materially stronger plate (Yoshioka.) that is corrosive resistive (Hwang). To gain the end result of Hwang using the method steps of Yoshioka will include the scope of claim 7. It would have been obvious to coat the plate before entering it into the hydraulic press or using a separate film and using a common bonding method (i.e. heat bonding) after the formation steps. It would have been obvious to use two sheets over the coating because the processing of Yoshioka can induce stress on the corrosive resistive membrane layer because of the bonding to other like atoms as well as to the surface of the plate. This stress can be removed by using a sheet of either nickel or aluminum, both of which can have an elongation till fracture comparable to stainless steel (20%) which makes it materially compatible with the process steps.

5. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka et al. (PGPUB 2001/0023603) as applied to claim 1 above, and further in view of Kumar et al. (WO 2004/030118) and Hwang et al (USPAT 6,090,228).

Yoshioka teaches a hydraulic deformation process of a stainless steel plate, but fail to teach a membrane between the plate and the water.

Hwang teaches that multiple layers on a plate can reduce the corrosive properties [Col 1 Ln 6]. This prior art provides motivation for providing a membrane on the plate, but does not teach a transfer of coating materials.

Kumar teaches a method of using a hydraulic press to press two layers together wherein one layer has a catalyst that transitions bonding to the other membrane layer during the press cycle [Paragraph 45].

It would have been obvious of one of ordinary skill in the art to use the method of transferring coating material from one layer to the other through a hydraulic press because the pressing mechanism is the same. It would also be obvious to combine Kumar and Yoshioka in order to obtain a material that has the properties taught by Hwang.

6. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka et al. (PGPUB 2001/0023603) as applied to claim 1 above, and further in view of Matsukawa (PGPUB 2003/0064278).

Yoshioka teaches a hydraulic deformation process of a stainless steel plate, But fails to teach a separator plate of carbon steel or aluminum.

Matsukawa teaches that bipolar plates can be made of carbon steel, stainless steel, aluminum, and titanium [Paragraph 49]. It would have been obvious to use these materials as replacements for the stainless steel plates taught in Yoshioka because

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they have similar elongation till break percentages as well as being commonly used separator plates.

7. Claims 11 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka et al. (PGPUB 2001/0023603) as applied to claim 1 above, and further in view of Katsuki et al. (PGPUB 2002/0127131).

Yoshioka teaches a hydraulic deformation process of a stainless steel plate, but fail to teach heating the plate. He also fails to teach that stainless steel should be heated between 1600-1300C.

Katsuki teaches that heating stainless steel to 1050C [Paragraph 43] will decrease cracking and have better formability [Abstract]. Yoshioka teaches this same motivation of reducing cracking [Paragraph 21]. It would have been obvious to one of ordinary skill in the art to heat the metal to its softening point to increase the ductility during processing. This heating was known to one of ordinary skill in the art at the time of the invention to increase the end strength by reducing cracks of the material after processing.

8. Claim 11 and 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka et al. (PGPUB 2001/0023603) as applied to claim 1 above, and further in view of Katsuki et al. (PGPUB 2002/0113064).

Yoshioka teaches a hydraulic deformation process of a stainless steel plate, but fail to teach heating the plate. He also fails to teach that Aluminum should be heated between 100-550C.

Katsuki teaches that heating Aluminum to 300-500C [Paragraph 94] will allow the metal to be more easily press-forged. This is process will allow Aluminum to be molded without cracks. Yoshioka teaches this same motivation of reducing cracking [Paragraph 21]. It would have been obvious to one of ordinary skill in the art to heat the metal to its softening point to increase the ductility during processing. This heating was known to one of ordinary skill in the art at the time of the invention to increase the end strength by reducing cracks of the material after processing.

9. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka et al. (PGPUB 2001/0023603) as applied to claim 1 above, and further in view of Masayoshi (WO 02/103073).

Yoshioka teaches a hydraulic deformation process of a stainless steel plate, but fail to teach heating the plate. He also fails to teach that carbon steel should be heated between 500-1000C.

Masayoshi teaches that the hot forming method of carbon steel is press formed at 800-1200C [Page 9 Ln 8]. This process will allow the carbon steel to be molded without cracks. Yoshioka teaches this same motivation of reducing cracking [Paragraph 21]. It would have been obvious to one of ordinary skill in the art to heat the metal to its softening point to increase the ductility during processing. This heating was known to

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one of ordinary skill in the art at the time of the invention to increase the end strength by reducing cracks of the material after processing.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEPHEN YANCHUK whose telephone number is (571)270-7343. The examiner can normally be reached on Monday through Thursday 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/
Supervisory Patent Examiner, Art
Unit 4131

/STEPHEN YANCHUK/
Examiner, Art Unit 4131